II. Remarks

Support for the various amendments made to the claims herein may be found throughout the application as field. In accordance with the Examiner's requirements, claims 42 and 43 are amended herein to overcome minor Section 112 problems noted by the Examiner. Claims 31-44 remain pending in the present patent application.

On March 18, 2008, a Final Office Action (hereafter "Final Office Action") was mailed rejecting all of the then-pending claims on the basis of UK Patent Application GB 2,247,938 A to Sherriff et al. (hereafter "the Sherriff reference"), U.S. Patent Publication No. 2005/0052426 to Hagermoser (hereafter "the Hagermoser reference"), U.S. Patent No. 4,719,455 to Louis (hereafter "the Louis reference"), U.S. Patent No. 6,198,473 to Armstrong (hereafter "the Armstrong reference"), and U.S. Patent No. 6,762,748 to Maatta et al. (hereafter "the Maatta reference").

The present Response and Amendment is submitted herewith in response to the Final Office Action, as well as to follow up on a telephone interview held with the Examiner on even date herewith, where no agreement was reached concerning the potential allowability of any of the still-pending claims.

Applicants' attorney respectfully requests entry of the minor amendments made herein so that in the event the claims as presented herein are deemed not to be allowable by the Examiner, notwithstanding the arguments presented herein, all the claims will be in condition for appeal.

III. Rejections of Claims Made in the Office Action

In the Final Office Action the Examiner rejected claims on the following bases:

(A) Claims 42 and 43 were rejected under Section 112, second paragraph as being indefinite;

(B) Claims 31, 35, 36, 38 and 41 were rejected under 35 U.S.C. Section 103(a) as being obvious over the Sherriff reference in view of the Hagermoser reference;

(C) Claims 32, 33 and 37 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over the Sherriff and Hagermoser references in view of the Louis reference;

(D) Claims 39 and 42-44 were rejected under 35 U.S.C. Section 103(a) as being obvious over the Sherriff and Hagermoser references in view of the Armstrong reference.

(E) Claim 40 was rejected under 35 U.S.C. Section 103(a) as being obvious over the Sherriff and Hagermoser references in view of the Maatta reference.

(F) Claim 34 was rejected under 35 U.S.C. Section 103(a) as being obvious over the Sherriff, Hagermoser and Louis references in view of the Armstrong reference.

The foregoing rejections are responded to below.

IV. The Cited References

(1) The Sherriff Reference

The first reference relied upon is GB 2 247 938 to Sherriff ("the Sherriff reference"), which discloses a capacitive control device for a computer comprising a puck which slides on the surface of platter 12, the position of the puck being detected capacitively. (See the Abstract of the Sherriff reference.) The puck may incorporate one or more push buttons, the depression of which may also be detected capacitively. Sherriff discloses various configurations of a puck that include electrodes, and a system where capacitive means are provided for detecting the position of a puck relative to a support member (see page 2, lines 20-25 of the Sherriff reference). Also disclosed is a puck capable of at least limited movement perpendicular to the support member, where the device comprises means connected to conductive regions for detecting the magnitude of the mutual capacitance, thereby enabling the position of the puck in the third (or z) dimension to be determined, and to be used to produce "an analog value and/or to control a respective switch." (See page 3, line 31 through page 4, line 5 of the Sherriff reference.) (Note that nowhere does the Sherriff reference define or expound upon what such an analog value might be or correspond to, or what the respective switch might control.)

Various portions of the Sherriff reference, including those cited by the Examiner, include the following:

The present invention relates to control devices for electronic equipment such as computers, and more particularly to puck members movable over the surface of a support member. Puck members can convert fingertip movements into electronic signals for data input to, or control of, electronic systems. They are particularly useful in association with personal computers and the pointing and position control devices for selecting and manipulating information viewed on a display screen. *Page 1, lines 4-14 of the Sherriff reference.*

In a preferred arrangement the puck member comprises a post extending through an aperture in the support member with plate means being mounted on the lower end of the post, the plate means carrying at least one first conductive region extending substantially parallel to the surface of the support member, and the support member carrying a plurality of further conductive regions facing said first conductive region and forming respective mutual capacitances therewith. *Page 2, lines 26-44 of the Sherriff reference.*

In a preferred modification the puck member or a part thereof is capable of at least limited movement perpendicularly to the support member and the device further comprises means connected to said further conductive regions for detecting the magnitude of the mutual capacitance. This enables the position of the puck member in the third (or z) dimension to be determined and can be used to produce an analogue value and/or to control a respective switch.

Spring members may be provided which tend to maintain the puck member in, or to return it to, a particular position. For example a circular puck member sitting on a circular platter can be sprung-loaded to the centre of the platter. ***This enables the puck device to simulate a joystick-type control.*** *[Emphasis added.] Page 3, line 32 through page 4, line 11, of the Sherriff reference.*

The ***direction, speed and acceleration movements of the fingertips on the puck can be translated into control values*** by sensing technology. The sensing is done by an arrangement of capacitive sensors underneath the platter which the puck sits on. A single capacitor plate related to the puck moves across normally four fixed reference capacitor plates. The difference in capacitance values between the four plates in the presence of the moving plate can be interpreted electronically to provide precise co-ordinates of position of the puck relative to the platter. Three or two fixed capacitor plates will provide simpler co-ordinates tending to a linear positioning system and five or more would give a more complex co-ordinate arrangement possibly incorporating error correction. *[Emphasis added.] Page 5, lines 6-20 of the Sherriff reference.*

In the context of computer screen cursor control, the fact that the movement of the puck is in itself constrained by a physical border or movement boundary means that the working area has a definite physical relationship to the operating zone of the computer screen cursor. The scale and resolution of the cursor movement can therefore be varied. In one form this can be achieved with specific settings for fine, medium and coarse control resolution and in another form this can be done through variable 'zoom magnification' settings. *[Emphasis added.] Page 6, line 30 through page 7, line 3 of the Sherriff reference.*

Referring to Figs 7 and 8, button 21 is sprung loaded relative to the puck 20 with a spring 28. Pillar 14 is connected at one end to the underside of the button and passes through the aperture 13 in the platter 22, and is connected at the other end to the puck PCB 15. The puck PCB and the main PCB 16 have capacitor sensors arranged, e.g. as in the first embodiment. Four springs 30, with respective spring mounting 31 fixed to the platter 22, are connected to the puck PCB to make the total puck assembly sprung loaded in a way to always return to a central position relative to the platter. Also the springs return the button on the puck to the highest position relative to the puck body. Vertical movement of button 21 may control an analogue value and/or and on-off switch. *Page 9, lines 14-29 of the Sherriff reference.*

Referring now to Fig. 14, rectangular puck 60 has three 'click' switches 69 and slides on a rectangular platter 62. Concealed under the platter are a fixed main PCB 66, and puck PCB 65. As shown in Fig. 15, the puck PCB 65 has on its surface a capacitor plate 67 for positional sensing and three capacitor plates 72, one for each 'click' switch. Fig. 16 shows the fixed main PCB 66 with a rectangular array of capacitor plates 68 for positional sensing and three separate capacitor plates 76 for passing switch information. In one preferred arrangement, connections from a conductive lead connected to the puck supply an electrical charge to the respective capacitor when a switch 69 is actuated. The arrangement is such that, despite movement of the puck, each plate 72 is always over part of its respective plate 76. *Page 10, lines 16-31 of the Sherriff reference.*

The above described arrangements have numerous advantages. The lateral position of the movable puck member can be determined precisely using small capacitance detection means which are simple and cheap to construct. Moreover third-dimensional information and/or switching information or instructions can also be detected by simple capacitive means. The control device can be easily electrically screened to eliminate interference. *Page 11, lines 24-32 of the Sherriff reference.*

Figs. 1 through 3 are reproduced hereinbelow, and show perspective, plan and cross-sectional views of the control device of Sherriff. Figs. 14 through 19 of the Sherriff reference are also reproduced hereinbelow, and show various portions of the capacitive sensor and touch control aspects of Sherriff's control device.

1/6

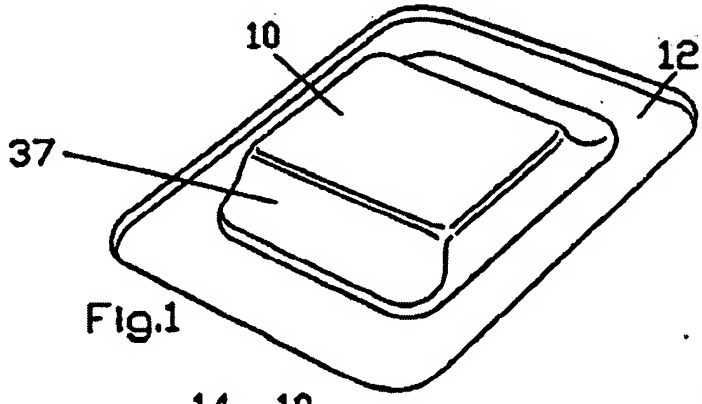


Fig.1

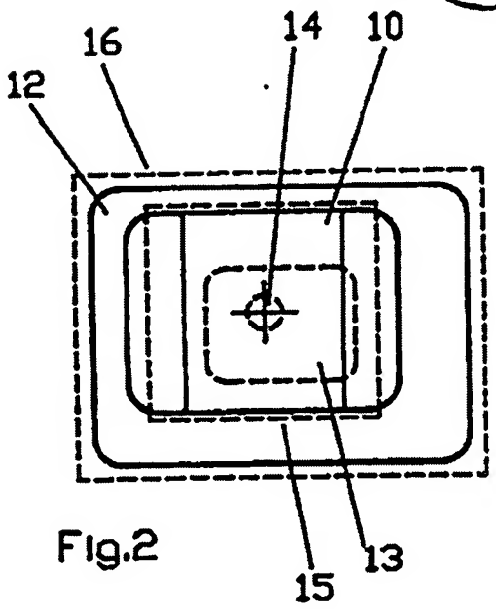


Fig.2

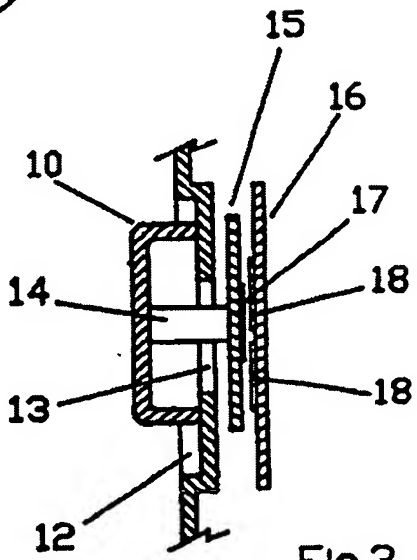


Fig.3

Figs. 1 through 3 of the Sherriff Reference

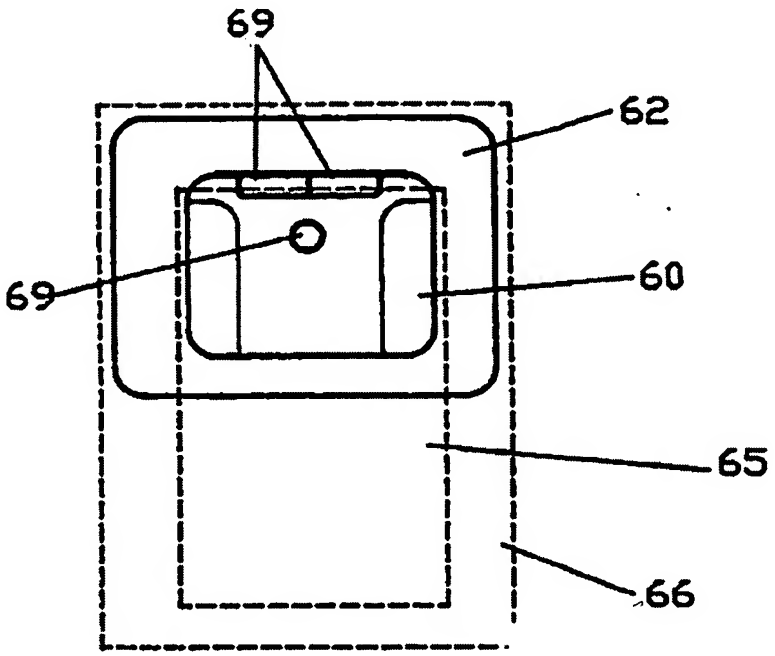


Fig.14

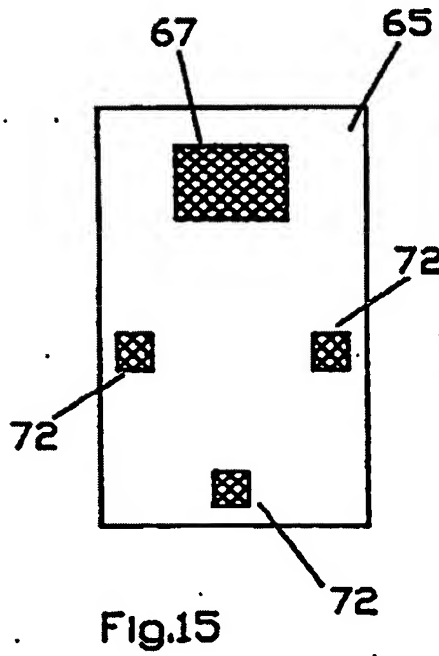


Fig.15

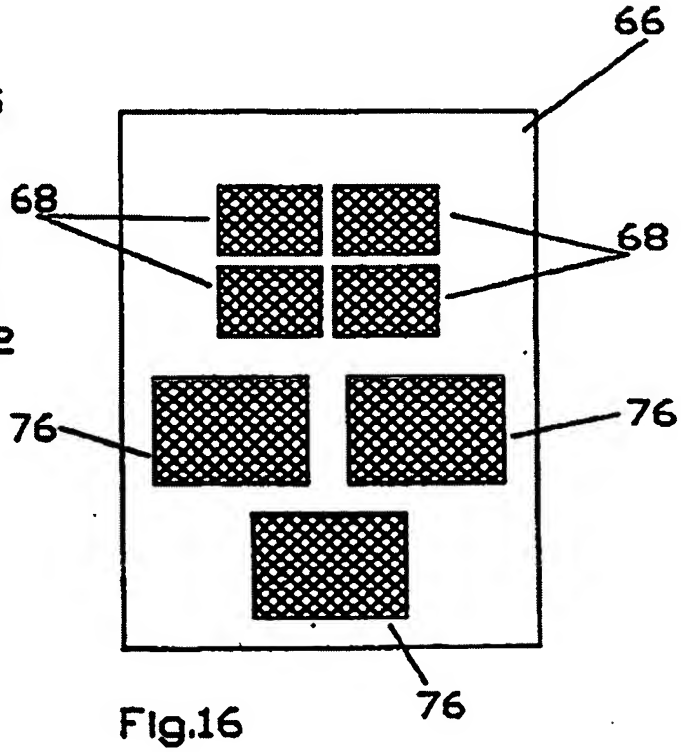


Fig.16

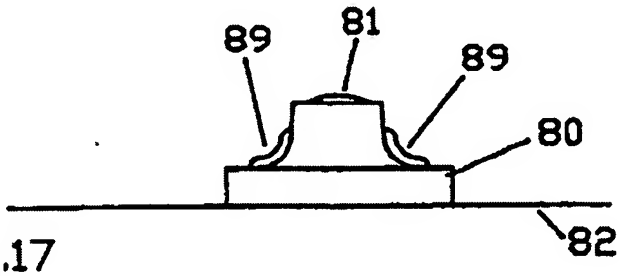


Fig.17

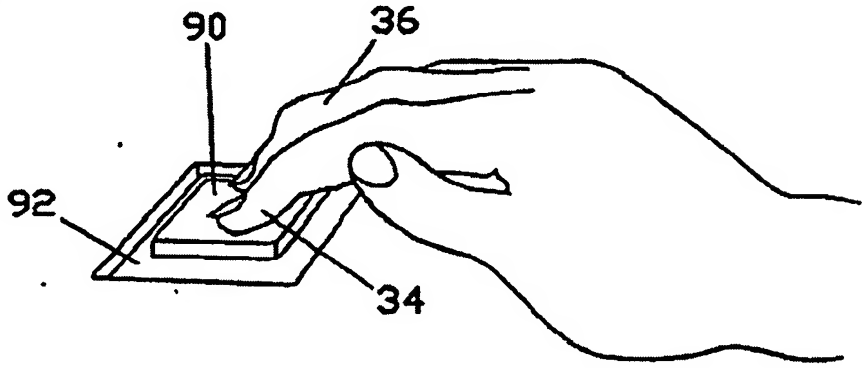


Fig.18

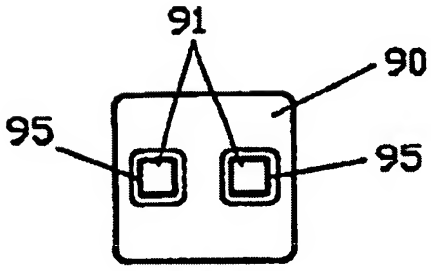


Fig.19

Figs. 17 through 19 of the Sherriff Reference

Click or pressure-sensitive buttons 21, 41, 69, 81 and 101 are disclosed and discussed in the Sherriff reference. However, nowhere is clicking or pressure-sensitive functionality in the Sherriff reference tied or linked to tracking or movement of a cursor, or to suspending tracking or movement of a cursor. While a re-centering mechanism is disclosed in the Sherriff reference (see Fig. 7 and page 4, first full paragraph), nowhere is a re-centering mechanism tied or linked to tracking or movement of a cursor, or to suspending tracking or movement of a cursor.

Although the Sherriff reference discloses the use of buttons and clicking functionality, nowhere does the Sherriff reference disclose a sensor activating or de-activating tracking when the user is touching (or not touching) a puck. Moreover, the Sherriff reference makes repeated reference to "joysticking" or velocity control with a puck, but mentions nowhere motion control of a cursor on a screen using a puck, or of implementing skating functionality with a puck. See, for example, page 5, first full paragraph, where a detailed discussion of the advantages of employing capacitive sensing technology for velocity control is set forth. In velocity control, the position of the puck defines the velocity and direction of cursor motion, not the position of the cursor.

Furthermore, there is no mention, hint at or suggestion in the Sherriff reference of overcoming the problems associated with having to skate far more often with a small form factor pointing device than with a conventional mouse. Laptops and other small computing devices require pointing devices that have small form factors, which of course creates certain problems. Perhaps foremost among the problems created by the requirement for a small form factor in a puck pointing device for a laptop is the small size of the substrate upon which the puck rides or is attached. When the puck reaches the edge of the puck field of motion (PFOM), and a cursor on a screen that is tracking in response to movement of the puck on the PFOM may not have not moved sufficiently far across the

screen. Thus, more skating is required using such small form factor puck devices than with a conventional mouse. Unfortunately, however, the problem of the cursor moving back to the center of the PFOM remains.

Reference to the last paragraph of page 6 of the Sherriff reference, which continues to the top of page 7, shows that Sherriff recommends varying the scale and resolution of cursor movement as the user brings the puck to the edge of the puck field of movement (PFOM). Thus, Sherriff is completely unaware of skating functionality as part of a solution to cursor control using a small form-factor pointing device, let alone employing pressure-sensitive means in combination with suspension of cursor activation and puck re-centering to permit the use of skating functionality in a small form-factor pointing device.

(2) The Hagermoser Reference

The second reference relied upon is U.S. Patent Publication No. 2005/0052426 to Hagermoser ("the Hagermoser reference"), which discloses a "touch input device for use in a vehicle such as an automobile. The touch input device includes a capacitive touch sensor that is disposed underneath a surface of the vehicle's interior that is accessible and touchable by an occupant of the vehicle. The touch sensor is configured so that a touch to a designated area of the surface activates the touch sensor by capacitive coupling between the touch implement and the touch sensor through the surface. The signals generated can be used to control or otherwise interact with displays and other electronic systems in the vehicle." See the Abstract of the Hagermoser reference.

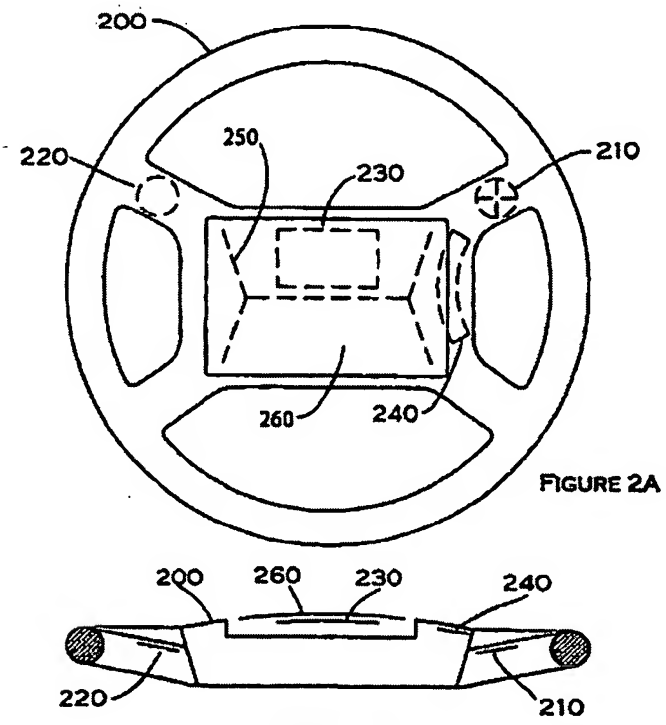
The Hagermoser reference further discloses:

As shown in Figs. 2A and 2B, discrete button sensor 220 is positioned on a spoke of the steering wheel and underneath the outer surface of the steering wheel. Discrete button sensor 220 is located for convenient access without requiring the driver to remove his or her hands from the steering wheel. Button sensor 220 measures the capacitive coupling with a conductive touch object, such as the driver's finger or thumb, as it approaches the designated portion of the surface of the steering wheel. As with other capacitive sensors, capacitive coupling can be measured by measuring current that flows through the completed circuit that includes the conductive touch implement and the conductive sensing elements of the sensor. ***At a predetermined or calibrated level of capacitive coupling, the button can be considered "pressed," allowing a "button down" signal to be sent. When the measured capacitive coupling falls below the threshold, a "button up" signal can be sent. In this way, a user can interact with the button sensor in a manner analogous to interaction with a mechanical button.*** A discrete button sensor can use any suitable conductor as its sensing element, such as a conductive foil covering the designated area, a conductive ink or other such material printed or coated to cover the designated area, a series of wires or conductive traces disposed to cover the designated area, or the like. Exemplary sensors that can be used as discrete button sensors in the present invention include those disclosed in International Publication WO 96/15464. *[Emphasis added.]* Paragraph 28 of the Hagermoser reference.

As shown in FIGS. 2A and 2B, a quadrant segmented sensor 210 can be positioned on a spoke of the steering wheel and disposed under the exterior surface of the steering wheel. As with discrete button 220, segmented sensor 210 can be located for easy access by the driver's thumb, for example, without requiring removing a grasp of the steering wheel. As shown, quadrant segmented sensor 210 utilizes four discrete conductive elements shaped as quarter circles within one circular-shaped sensor. By placing a finger or thumb in the designated area over sensor 210, the action of rocking the finger or thumb in any direction results in a change in capacitive coupling in at least one of the segments. ***This change can be measured to determine the direction and magnitude of the movement*** **[i.e., velocity control – not motion control]**, ***which in turn can be translated into cursor movement or other***

instructions to a display or other electronic equipment in the vehicle. Exemplary quadrant segmented sensors include those disclosed in U.S. Pat. No. 4,755,634." *[Emphasis added.]* Paragraph 29 of the Hagermoser reference.

Figs. 2A and 2B of the Hagermoser reference are reproduced hereinbelow.



Figs. 2A and 2B of the Hagermoser Reference

As shown above, click or pressure-sensitive buttons are disclosed and discussed in the Hagermoser reference. However, nowhere is clicking or pressure-sensitive functionality in the Hagermoser reference tied or linked to suspending tracking or movement of a cursor. Instead, those portions of the Hagermoser reference cited by the Examiner relate – in a light most favorable to the Examiner's position – to velocity control of a cursor. Moreover, no re-centering mechanism of any type is disclosed in the Hagermoser reference, nor is a re-centering mechanism tied or linked to tracking or movement of a cursor, or to suspending tracking or movement of a cursor, anywhere in the Hagermoser reference.

Although the Hagermoser reference discloses the use of buttons and clicking functionality, nowhere does the Hagermoser reference disclose a sensor activating or de-activating tracking when the user is touching (or not touching) a puck. Moreover, the Hagermoser reference makes reference to "joysticking" or velocity control, but mentions nowhere motion control of a cursor on a screen using a puck or any other means, or of implementing skating functionality with a puck or any other means. In velocity control, the position of the puck defines the velocity and direction of cursor motion, not the position of the cursor.

Furthermore, there is no mention, hint at or suggestion in the Hagermoser reference of overcoming the problems associated with having to skate far more often with a small form factor pointing device than with a conventional mouse (as discussed in detail above respecting the Sherriff reference).

(3) The Louis Reference

The third reference relied upon is U.S. Patent No. 4,719,455 to Louis ("the Louis reference"), which discloses "[a] pointing and control device for moving a cursor on a visual display and for controlling various operations, being operated by hand and finger movements, including both fine movement control and gross movement control; the assembly includes a graspable outer cover and an inner puck with a finger cup movably supported by a series of elements, a laser beam movement detector consisting of high and low frequency scanners, drivers, lower and upper photodetectors and signal amplifiers and processors. The entire assembly may be either fixed on a keyboard or operated as an independent accessory." See the Abstract of the Louis reference.

The Louis reference further discloses:

> This invention seeks to provide greater precision and to conform more closely to the operator's motor skills developed over his lifetime. Largely control of drawing and pointing operations is developed through eye-hand coordination and feedback in the common tasks of drawing and writing with pen and paper. These same arm, hand and finger movements are captured as input by the present invention and reflected on a computer screen to provide visual feedback, simulating the eye-hand coordination of writing operations. The present device provides two-level control. First, gross movement input from arm muscle action is transmitted through the thumb and middle finger grasping the outer cover of the pointing device which moves throughout a detectable range relative to the fixed base. Second, fine detail is controlled by the index finger resting on a small cup that glides easily along a spherical surface approximating the natural path of the finger tip as it pivots on its joints.

Other control movements may also be incorporated in the design of the control device. For example, a switching action can be provided by downward pressure on the finger cup by the index finger. This is analogous to pressing a writing implement against paper to leave a mark or continuous line or to vary the width of a line. The device integrates these three input movements allowing the operator to utilize, in his discretion, the same skills developed with pencils and pens but with the hand remaining in substantially the same place on the device. Since the device is symmetrical, it can be operated from either hand. Col. 1, lines 38-64 of the Louis reference.

The cursor in the present invention is moved across the screen in a speedy and accurate way, by an integrated signal combining gross movement of the cover 11 and fine movement of the puck 12. By comparison, devices of the prior art including key controls and mouse-type controls either move in slow incremental manner or in gross fashion only. The function or operation selection process, on the other hand, is distinct from the optical mechanism. Such process is simply accomplished by downward finger pressure on the finger cup 13. ***The signal resulting from the pressure on the finger cup 13 could be interpreted by the computer 45 according to the programmed function sought by the user. The signal could, for example, be interpreted as a simple ON-OFF switch. In the alternative, the computer 45 could interpret the magnitude of the pressure on the finger cup 13 as graphic commands."*** *[Emphasis added.]* Col. 5, line 66 through col. 6, line 16 of the Louis reference.

The design allows for at least three types of movement with coarse and fine control in one plane. The first movement is the X and Y gross horizontal movement of the cover 11 as will be later explained and as shown in phantom lines in FIG. 1. The second is the fine fingertip control movements of the puck 12 controlled by an index finger resting in the cup 13 and moving in a generally X-Y plane and the third is downward movement of the puck 12 or Z-axis movement caused by increasing pressure of fingertip in the cup 13.

These three movements are integrated to simulate the natural use of the hand and arm. In writing for example, one forms individual letters by finger action and moves from letter or groups of letters in gross arm-directed-jumps. Some patterns involve simultaneous action of fingers and arm. For example, making a raster-like pattern when the fingers direct a continuous rapid up-and-down motion, while the wrist makes steady horizontal movement.

Likewise, when using the pointing device 10, the arm moves the cover 11, which would direct the cursor or indicator in a gross movement toward the desired point on the visual display or screen.

As the desired point is approached the finger moves the puck 12, which would accurately position the cursor on the screen. This requires the coordinated finger muscles, which are used in writing and sketching, to guide the puck 12.

Once the cursor is positioned, there remains to select and control various functions or operations. This is accomplished by downward finger pressure on the finger cup 13.

This finger pressure is translated into either an ON-OFF function or an analog response that could be used to vary the width or density of the lines as with pressing on a pencil.

Other controlling movements of the elements of the device or additional buttons or switches placed around the perimeter of the device can add convenient functional capabilities. *[Emphasis added.]* Col. 2, line 52 through col. 3, line 23 of the Louis reference.

Figs. 1-4 of the Louis reference are reproduced hereinbelow.

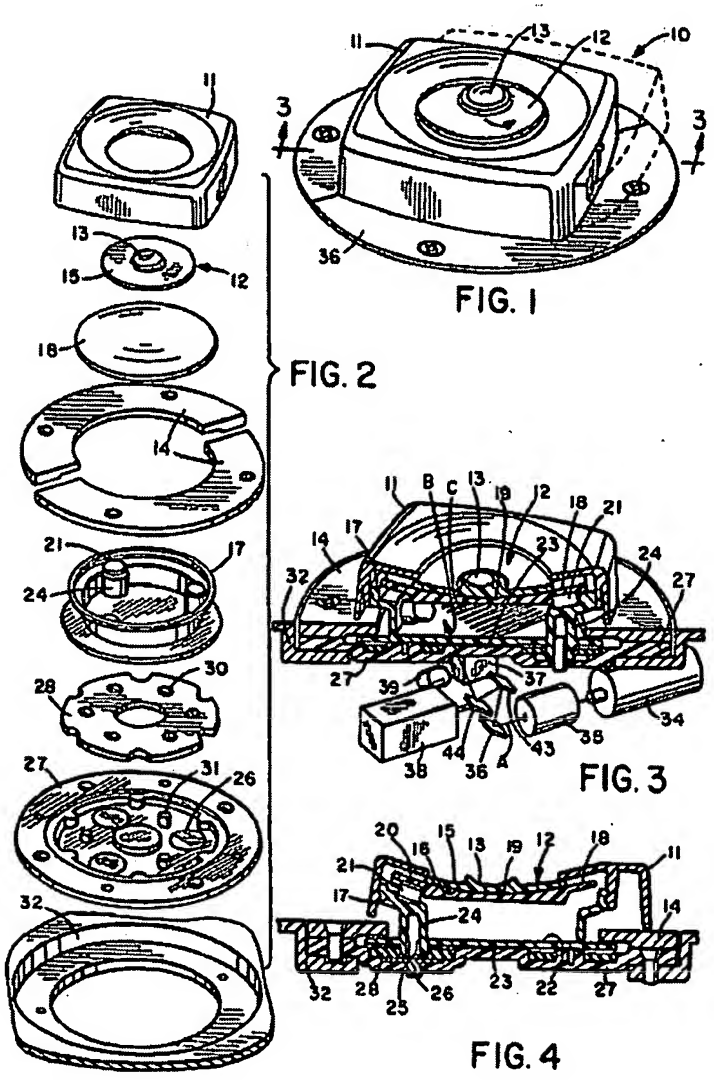


FIG. 1

FIG. 2

FIG. 3

FIG. 4

Figs. 1-4 of the Louis Reference

As shown above, click or pressure-sensitive buttons are disclosed and discussed in the Louis reference. However, nowhere is clicking or pressure-sensitive functionality in the Louis reference tied or linked to suspending tracking or movement of a cursor. Instead, those portions of the Louis reference cited by the Examiner relate – in a light most favorable to the Examiner's position -- to fine or coarse control of a cursor. Moreover, no re-centering mechanism of any type is disclosed in the Louis reference, nor is a re-centering mechanism tied or linked to tracking or movement of a cursor, or to suspending tracking or movement of a cursor, anywhere in the Louis reference.

Although the Louis reference discloses the use of buttons and clicking functionality, nowhere does the Louis reference disclose a sensor activating or de-activating tracking when the user is touching (or not touching) a puck. Moreover, the Louis reference mentions nowhere motion control of a cursor on a screen using a puck, or of implementing skating functionality with a puck. In velocity control, the position of the puck defines the velocity and direction of cursor motion, not the position of the cursor.

Furthermore, there is no mention, hint at or suggestion in the Louis reference of overcoming the problems associated with having to skate far more often with a small form factor pointing device than with a conventional mouse (as discussed in detail above respecting the Sherriff reference).

(4) The Armstrong Reference

The fourth reference relied upon is U.S. Patent No. 6,198,473 to Armstrong ("the Armstrong reference"), which discloses:

> A desktop operated computer control mouse including a housing, electronic circuitry within the housing, a user manipulable rotatable ball for pointing control, a plurality of finger depressible buttons exposed on the housing and interfacing with sensors electrically connected with the circuitry. At least some of the finger depressible buttons are for user selection of signals to be sent to the computer for window or screen scroll control, and are associated with sensor(s) which are pressure-sensitive analog sensors structured for varying electrical conductance through at least three readable states or values. ***The readable states are dependant upon depressive pressure applied to the sensor(s) through the finger depressible button(s).*** The circuitry is structured to read the at least three readable states of the pressure-sensitive analog sensor(s) and to produce signals representing the state or value of the sensor(s). In one embodiment, the analog sensor(s) are elastomeric dome-cap sensor(s) including pressure-sensitive variable-conductance material positioned over proximal circuit elements of the circuitry. In another embodiment the sensors are packaged sensors including button depressible concavo-convexed conductive disks positioned to compress pressure-sensitive variable-conductance material forming at least a portion of an electrical flow path through the packaged sensor. ***The analog sensors are associated with window or screen scroll control, and provide user determinable scroll rates dependant upon pressure applied by the user through ergonomically correct finger depressible buttons.*** Methods of use and manufacture are also disclosed." *[Emphasis added.]* Abstract of the Armstrong reference.

In support of the final rejection of some of the still-pending claims, the Examiner cited the following portions of the Armstrong reference:

Benefits of the tactile feedback include a reduction of potential confusion on the part of the user as to when the sensor is initially actuated and de-actuated. *Col. 9, lines 17-20 of the Armstrong reference.*

The pressure applied to conductive cap 52 is transferred in pressure-sensitive variable-conductance material 54 and the conductance between circuit elements 40 and 42 is varied upon varied compressive pressure on material 54. *Col. 21, lines 44-48 of the Armstrong reference.*

FIGS. 16-18 show a top view of two conductive elements 16, 18 in various proximal arrangements as they may be applied to a circuit board 111 in sensor embodiments useful with the present invention, particularly elastomeric dome-cap sensors wherein the active element 14 (or material 54) spans the two proximal conductive circuit elements 16, 18 to bridge the elements which are extensions of the circuitry of a circuit board such as discussed above in regards to circuit board 111. *Col. 21, line 65 through col. 22, line 3 of the Armstrong reference.*

In accordance with the present invention, device 100 also has pressure-sensitive variable-conductance material 54 as an active element of sensor types such as finger depressible analog scroll buttons or sensors 39, 10, 28, 30 for inputting data representing the analog value or current state to microcontroller 114. Microcontroller 114 outputs, such as through a serial port PS/2 or USB or the like, ***for output of screen scrolling control signals for at least two scroll rates or speeds***, select button function-control signals and pointer control signals to a host computer with monitor. *[Emphasis added.] Col. 22, lines 24-34 of the Armstrong reference.*

Figs. 15 through 19 of the Armstrong reference are reproduced hereinbelow.

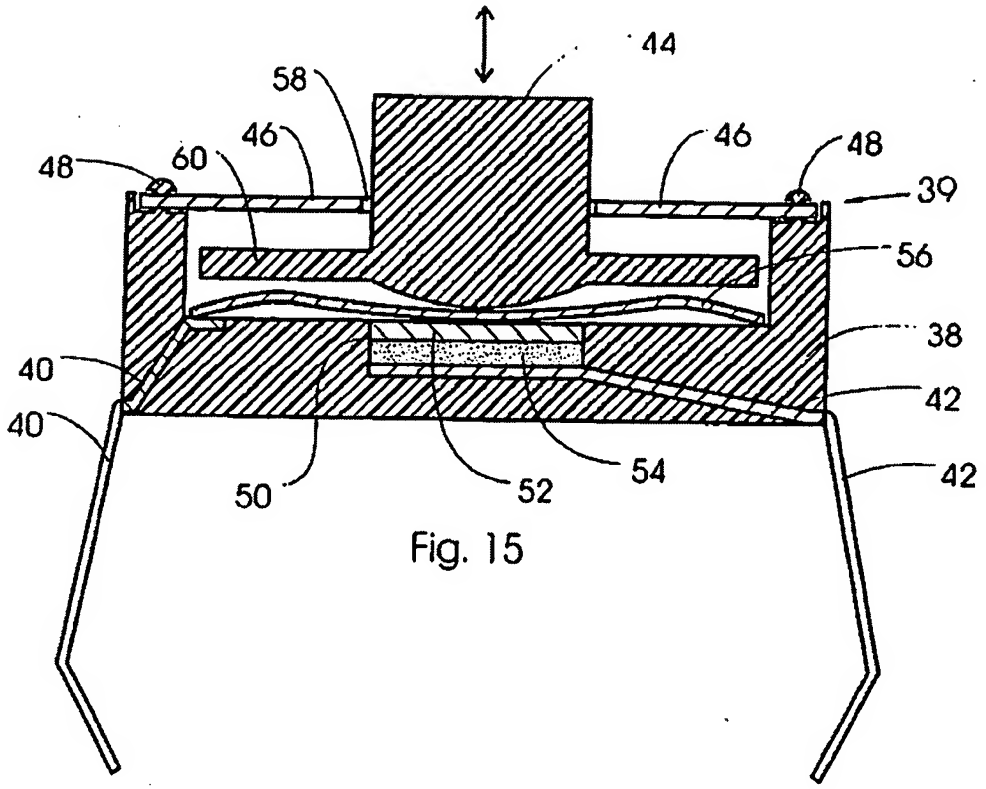


Fig. 15

Fig. 15 of the Armstrong Reference

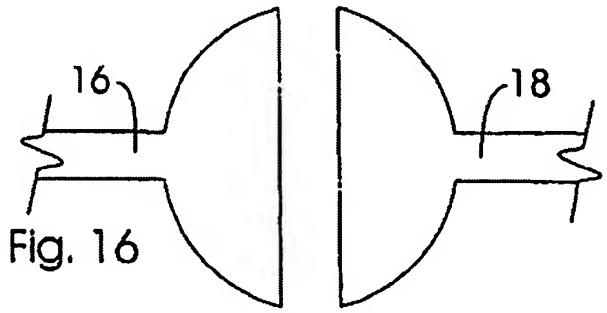


Fig. 16

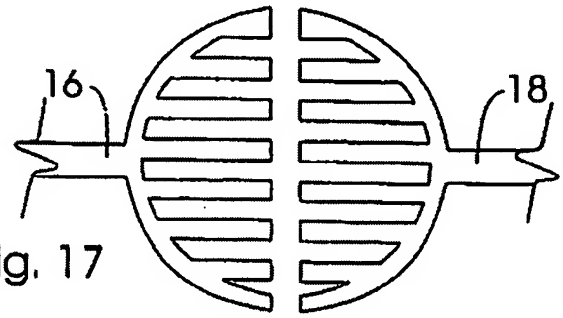


Fig. 17

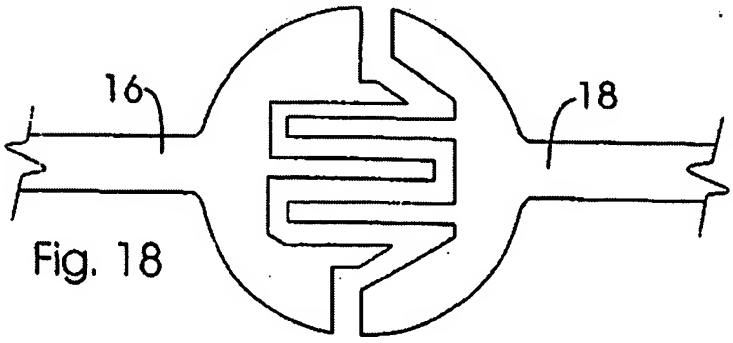


Fig. 18

Figs. 16-18 of the Armstrong Reference

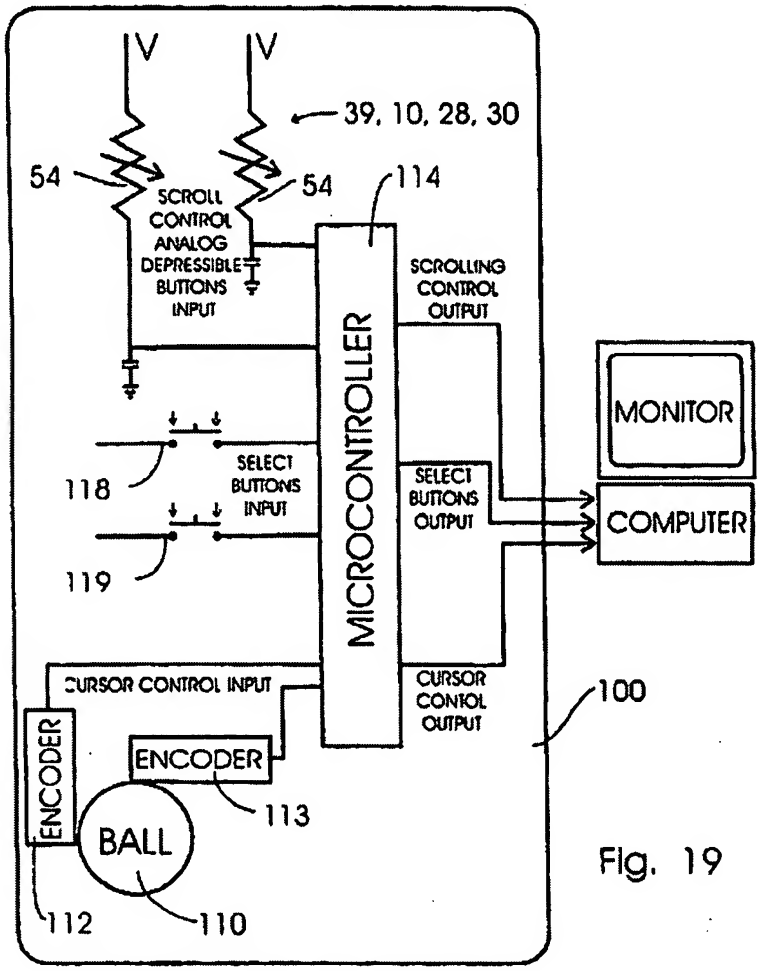


Fig. 19

Fig. 19 of the Armstrong Reference

The Armstrong reference is directed to providing solutions to problems associated with a user scrolling by means of a mouse. To that end, Armstrong provides pressure-sensitive analog sensors structured for varying electrical conductance through at least three readable states or values. The readable states are dependant upon depressive pressure applied to the sensors through the finger depressible buttons. The circuitry is structured to read the at least three readable states of the pressure-sensitive analog sensor(s) and to produce signals representing the state or value of the sensors. The analog sensors are associated with window or screen scroll control, and provide user determinable scroll rates dependant upon pressure applied by the user through ergonomically correct finger depressible buttons.

Although the Armstrong reference discloses the use of buttons and clicking functionality, there is no mention of a sensor to activate or de-activate tracking when the user is touching (or not touching) the puck. Moreover, the Armstrong reference makes repeated reference to scrolling and window control with a mouse, but mentions nowhere motion control of a cursor on a screen using a puck, or of implementing skating functionality with a puck.

Furthermore, there is no mention, hint at or suggestion in the Armstrong reference of the problems associated with duplicating the functionality of a conventional mouse using a puck system in a laptop, for example, or of overcoming the problems associated with having to skate far more often with a small form factor pointing device than with a conventional mouse, as discussed in greater detail above.

(5) The Maatta Reference

The fifth reference relied upon is U.S. Patent No. 6,763,748 to Maatta et al. ("the Maatta reference"), which discloses a low profile input device for moving a cursor, scrolling a page, or selecting a function on a display of a handheld device. A planar joystick is used to move a cursor on the display of a handheld device and comprises a movable sliding button having a first magnet M1 embedded therein. The button is slid by a user's finger over a second magnet M2, an action that distorts the magnetic flux, which is detected by a plurality of magnetic flux sensors. The direction and magnitude of the cursor movement on the display correspond to the change in flux caused by the movement of the sliding button. In other words, Maatta discloses a velocity control pointing device, not a motion control pointing device. See the Abstract of the disclosure of the Maatta reference.

Figs. 2 and 4a of the Maatta reference are reproduced hereinbelow.

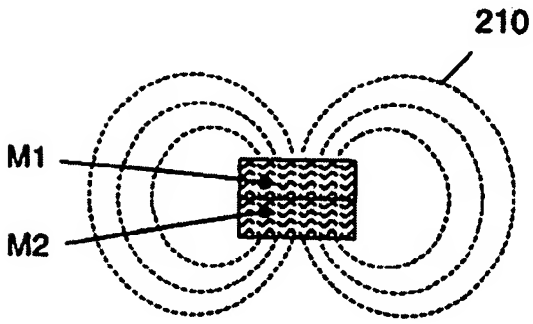


Figure 2a

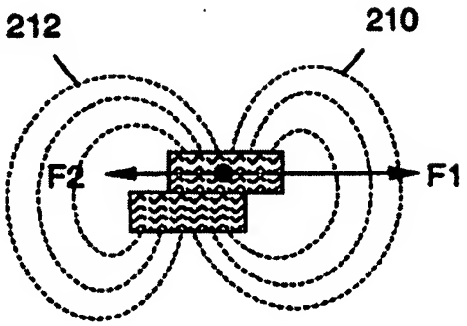


Figure 2b

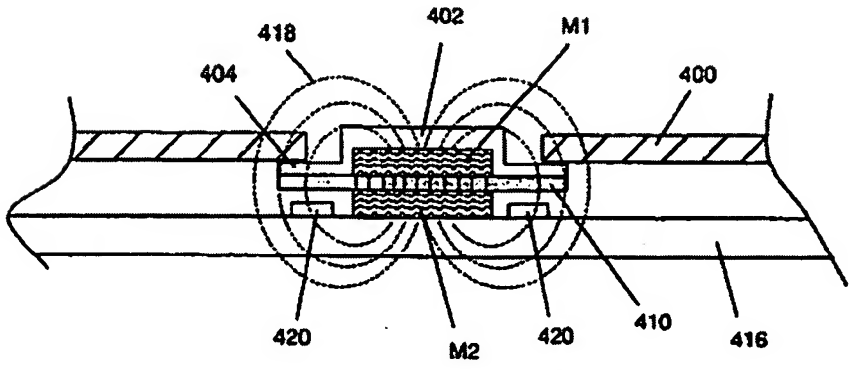


Figure 4a

Although the Maatta reference discloses the use of buttons and clicking functionality, there is no mention of a sensor to activate or de-activate tracking when the user is touching (or not touching) a puck. Moreover, the Maatta reference makes repeated reference to re-centering of a puck by means of magnets, but mentions nowhere how to implement skating functionality with a puck. Furthermore, there is no mention, hint at or suggestion in the Maatta reference of the problems associated with having to skate far more often with a small form factor pointing device than with a conventional mouse, as discussed in greater detail above.

V. Response to Rejections Made in the Final Office Action

(A) Claims 42 and 43 are amended herein to overcome the Section 112 rejection

Claims 42 and 43 are amended herein to overcome the Section 112 rejection. Entry of the amendments is respectfully requested, as agreed to by the Examiner in the May 19 telephone interview so that the claims may be placed in condition for appeal (should an appeal become necessary).

(B) Claims 31, 35, 36, 38 and 41 are not obvious over the Sherriff reference in view of the Hagermoser reference

Reference to independent claim 31 shows that this claim, and the still-pending claims depending from such claim (in other words, all of the still pending claims), contain several elements and limitations disclosed nowhere in the cited Sherriff and Hagermoser references. More particularly, reference to claim 31 shows that all the following elements and limitations are recited therein, as well as in claims 32-44 depending therefrom:

(a) A pointing system, comprising:

(b) a moveable puck configured to move laterally within a puck field of motion ("PFOM") in response to a user applying a lateral force thereto;

(c) the puck comprising a pressure sensing system configured to sense a first predetermined vertical pressure level applied by the user to the puck;

(d) a position detector configured to measure puck position within the PFOM as the puck is moved laterally by the user therewithin;

(e) the position detector further being configured to report the puck position to a processor configured to actuate or cause to be actuated tracking or movement of a cursor on a display;

(f) the tracking or movement of the cursor corresponding to lateral movement of the puck by the user within the PFOM; and

(g) a puck return mechanism attached to the puck and configured to return the puck to, or hold the puck in, a resting position within the PFOM when the user stops applying, or does not apply, vertical pressure to the puck;

(h) wherein the system is configured to actuate or cause to be actuated tracking or movement of the cursor on the display corresponding to lateral movement of the puck by the user within the PFOM;

(i) when the user applies vertical pressure to the puck that is greater than or equal to the first predetermined vertical pressure level;

(j) and to cause the cursor to stop tracking or moving on the display when the user applies vertical pressure to the puck that is at least one of less than the first predetermined level and no vertical pressure.

A studied review of the Sherriff and Hagermoser references shows that ***neither of those references discloses elements (i) or (j) of claim 31 as presented herein, explicitly, by implication, inherently or otherwise.*** Instead, those references disclose the subject matter described in detail above.

The Sherriff reference basically discloses a capacitive puck system with velocity control. Sherriff recommends varying the scale and resolution of cursor movement as a user brings a puck to the edge of the puck field of movement (PFOM). Thus, Sherriff is completely unaware of skating functionality as part of a solution to cursor control using a small form-factor pointing device, let alone employing pressure-sensitive means in combination with suspension of cursor activation and puck re-centering to permit the use of skating functionality in a small form-factor pointing device.

The Hagermoser reference basically teaches a capacitive switch that may be turned or actuated on or off (as pointed out by the Examiner), and in a fashion similar to the Sherriff reference also discloses velocity control (*e.g.*, see paragraph 29 of the Hagermoser reference). The Hagermoser reference thus refers to "joysticking" or velocity control, but mentions nowhere motion control of a cursor on a screen, or of implementing skating functionality. In velocity control, the position of the puck defines the velocity and direction of cursor motion, not the position of the cursor.

During the telephone interview with the Examiner on May 19, the issue of element (j) in claim 31 was discussed in some detail. During the telephone interview, the Examiner insisted repeatedly that the Hagermoser reference discloses such element [*"(j) and to cause the cursor to stop tracking or moving on the display when the user applies vertical pressure to the puck that is at least one of less than the first predetermined level and no vertical pressure"*]. However, despite repeated request from the applicants' attorney that the Examiner point out with specificity where precisely in the Hagermoser reference all the elements and limitations recited in element (j) were to be found in the Hagermoser reference, no such specificity was forthcoming. Instead, the Examiner, as best the applicant's attorney could discern, essentially stated that the Hagermoser reference provided the elements recited in claim 31 that were missing from the Sherriff reference, ands thus the claimed invention was obvious. Attempts to discuss the new functionality of the claimed invention were deflected by the Examiner and essentially ignored. Claim 31, and all claims depending therefrom, require that the pointing device have skating functionality, which is disclosed ***nowhere*** in the Sherriff or Hagermoser references.

As pointed to the Examiner during the telephone interview, the Examiner appears not to have appreciated the importance of how sensing and control are accomplished in the invention, and how these factors affect the fundamental usability of the device. This comes back to the distinction between a position control input device (like a mouse) and a velocity control input device (like a joystick). Because the invention employs a finger sensor, the invention takes what is traditionally a velocity control device (*e.g.*, a puck with springs) and makes it behave like a position control device (*e.g.*, a mouse). This creates a completely different user experience in a compact form factor, compatible with laptops or mobile devices. It has been discovered in the present invention that

users navigate to icons approximately twice as fast with a position control device than with a velocity control joystick. The use of a finger sensor to modify navigation in this way is in no way an obvious extension of the puck of Sherriff or the button of Hagermoser.

Furthermore, there is no mention, hint at or suggestion in the Sherriff or Hagermoser reference of overcoming the problems associated with having to skate far more often with a small form factor pointing device than with a conventional mouse.

In relying upon a theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic ***necessarily*** flows from the teachings of the applied prior art (*i.e.*, the Sherriff reference. *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). Here, and as discussed above in detail, the Sherriff and Hagermoser references fail to disclose, teach or suggest elements (i) or (j) of claims 31-44, and reveals a complete unawareness of skating functionality as part of a solution to cursor control using a small form-factor pointing device, let alone employing pressure-sensitive means in combination with suspension of cursor activation and puck re-centering to permit the use of skating functionality in a small form-factor pointing device. Thus, not only are several structural elements now recited in the present claims completely missing from the Sherriff and Hagermoser references, there is also no awareness of the problems in the Sherriff and Hagermoser references that are solved by the presently claimed invention. Consequently, the characteristics alleged to be inherent in the Sherriff reference simply cannot necessarily flow from the teachings of the Sherriff reference – those characteristics are missing, and there is no knowledge of the problems solved that would point one of ordinary skill in the direction of the inventions recited in the new claims presented herein.

The Applicants have discovered that a certain novel combination of electrical, electronic and structural components combined and configured in a certain order are required to produce the beneficial effects of the present invention. As demonstrated above, at least two of those components are not disclosed or suggested anywhere in the Sherriff or Hagermoser references, and accordingly cannot be *prima facie* obvious.

Merely asserting that "would be obvious to try" the invention by making reference to the capacitively-operated mouse of Sheriff, and the pressure-sensitive button of Hagermoser, while essentially creating other claimed elements out of whole cloth without referring to any specific portions of the cited references to establish a motivation for combining elements or functionality disclosed therein, does not establish a *prima facie* case of obviousness. In going from the prior art to the claimed invention, one cannot base obviousness on what a person skilled in the art might try or find obvious to *try*, but rather must consider what the prior art would have lead a person skilled in the art to *do*.

There is no incentive, teaching or suggestion in the Sherriff or Hagermoser references to produce the inventions now recited in claims 31, 35, 36, 38 and 41. The mere fact that the cited Sherriff and Hagermoser references could, with the benefit of hindsight, produce something vaguely similar to the present invention does not make the modification obvious, or suggest the desirability of the modification required to arrive at the present invention. Indeed, this conclusion is buttressed by the fact that several important elements and limitations are missing in the Sherriff and Hagermoser references in respect of claims 31, 35, 36, 38 and 41 as presented herein (and as discussed in detail above).

It is well settled that a motivation to combine elements or limitations disclosed in disparate references *must be found within the references themselves or from pertinent sources of extrinsic information,* and that such a motivation does not arise, as here, by merely identifying a collection of disparate piece parts in a combination of references, and then asserting it would have been obvious to take such disparate elements and limitations and add many others thereto to arrive at the presently claimed invention.

There is no suggestion of what direction any experimentation should follow in the Sherriff and Hagermoser references to obtain the invention now recited in claims 31, 35, 36, 38 and 41. Accordingly, the result effective variables, for example providing skating functionality by disabling cursor movement when a puck is re-centered, are not known to be result effective. Thousands or millions of attempts at variations might be made before arriving at the desired improvement. Thus, to say that it would be obvious to read the Sherriff and Hagermoser references and somehow arrive at the inventions now recited in claims 31, 35, 36, 38 and 41 would clearly not be the test for obviousness.

The foregoing analysis also makes it clear that there is no basis in the art for modifying the teachings of the Sherriff and Hagermoser references to arrive at the inventions now recited in claims 31, 35, 36, 38 and 41. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. The Sherriff and Hagermoser references do not teach the problems associated with providing a small form-factor pointing device and the skating functionality that must be provided therewith.

When, as here, the prior art itself provides no apparent reason for one of ordinary skill in the art to make a modification or to combine references, an argument clearly does not exist that the claimed subject matter would have been obvious. Thus, an attempt to use the applicants' own disclosure as a blueprint to reconstruct in hindsight the invention now recited in claim as amended herein out of isolated teachings appearing in the prior art is clearly improper.

The results and advantages produced by the invention set forth in claims 31, 35, 36, 38 and 41 as presented herein, and of which the cited Sherriff and Hagermoser references are devoid, cannot be ignored simply because the claim limitations might be deemed similar to the otherwise barren prior art.

The foregoing analysis also makes it clear that many limitations appearing in claims 31, 35, 36, 38 and 41 as presented herein are not present in the Sherriff and Hagermoser references. When evaluating a claim for determining obviousness, *all* limitations of the claim must be evaluated. Under §103, the Examiner cannot dissect claims 31, 35, 36, 38 and 41 as presented herein, excise the various individual elements recited in the claim, and then declare the remaining portions of the mutilated claim to be unpatentable. The Examiner must follow the basic rule of claim interpretation of reading the claims as a whole. Accordingly, the Sherriff and Hagermoser references may not properly be used as a basis for rejecting claims 31, 35, 36, 38 and 41 as presented herein under §103.

Finally, the function, way and result provided by the devices and methods disclosed in the Sherriff and Hagermoser references are completely different from those provided by the presently claimed inventions. All the devices and methods disclosed in the Sherriff and Hagermoser references are completely lacking in any recognition of one of the fundamental problems solved by the present invention, namely ***providing skating functionality by disabling cursor movement when a puck is re-centered***. Nowhere do the Sherriff and Hagermoser references teach

anything regarding such a problem, even though many of the physical elements of an environment that produce such a problem are disclosed therein (i.e., a small form-factor pointing device). Thus, there is no motivation or suggestion present in the Sherriff and Hagermoser references somehow to arrive at the at least two elements recited in claims 31, 35, 36, 38 and 41 that are missing from such references. Such opposing functions, ways and results establish yet further that the presently-claimed invention is not *prima facie* obvious over and in view of any combination of the Sherriff and Hagermoser references.

For all the foregoing reasons and more, the presently claimed invention is not *prima facie* obvious over and in view of the Sherriff and Hagermoser references.

(C) Claims 32, 33 and 37 are not obvious over the Sherriff and Hagermoser references in view of the Louis reference

Claims 32, 33 and 37 include all the limitations of claim 31, from which they depend. The asserted obviousness of claim 31 in respect of the combination of the Sherriff and Hagermoser references is rebutted in detail above, and the same arguments therefore apply to both such references in respect of claims 32, 33 and 37. In particular, elements (i) and (j) recited in claim 31 are missing from the Hagermoser and Sherriff references.

Those same elements (and more) are also missing from the Louis reference, the content of which is discussed in detail above. The Louis reference discloses fine or coarse control of a cursor. No re-centering mechanism of any type is disclosed in the Louis reference No re-centering mechanism tied or linked to tracking or movement of a cursor, or to suspending tracking or movement of a cursor, is disclosed anywhere in the Louis reference.

Accordingly, the Louis reference does nothing to make up for the rather acute deficiencies of the Sherriff and Hagermoser references respecting the asserted obviousness of claims 32, 33 and 37, and as a result all the arguments set forth above in Section V(B) respecting the unobviousness of the present invention also apply to claims 32, 33 and 37.

For all the foregoing reasons and more, the presently claimed invention is not *prima facie* obvious over and in view of the Sherriff, Hagermoser and Louis references.

(D) Claims 39 and 42-44 are not obvious over the Sherriff and Hagermoser references in view of the Armstrong reference

Claims 39 and 42-44 include all the limitations of claim 31, from which they depend. The asserted obviousness of claim 31 in respect of the combination of the Sherriff and Hagermoser references is rebutted in detail above, and the same arguments apply to both such references in respect of claims 39 and 42-44. In particular, elements (i) and (j) recited in claim 31 are missing from the Hagermoser and Sherriff references.

Those same elements (and more) are also missing from the Armstrong reference, the content of which is discussed in detail above. Although the Armstrong reference discloses the use of buttons and clicking functionality, there is no mention of a sensor to activate or de-activate tracking when the user is touching (or not touching) the puck. Moreover, the Armstrong reference makes repeated reference to scrolling and window control with a mouse, but mentions nowhere motion control of a cursor on a screen using a puck, or of implementing skating functionality with a puck. Furthermore, there is no mention, hint at or suggestion in the Armstrong reference of the problems associated with duplicating the functionality of a conventional mouse using a puck system in a laptop, for example, or of overcoming the problems associated with having to skate far more often with a small form factor pointing device than with a conventional mouse, as discussed in greater detail above.

Accordingly, the Armstrong reference does nothing to make up for the rather acute deficiencies of the Sherriff and Hagermoser references respecting the asserted obviousness of claims 39 and 42-44, and as a result all the arguments set forth above in Section V(B) respecting the unobviousness of the present invention also apply to claims 39 and 42-44.

For all the foregoing reasons and more, the presently claimed invention is not *prima facie* obvious over and in view of the Sherriff, Hagermoser and Armstrong references.

(E) Claim 40 is not obvious over the Sherriff and Hagermoser references in view of the Maatta reference

Claim 40 includes all the limitations of claim 31, from which it depends. The asserted obviousness of claim 31 in respect of the combination of the Sherriff and Hagermoser references is rebutted in detail above, and the same arguments apply both such references in respect of claim 40. That is, elements (i) and (j) are missing from the Sherriff and Hagermoser references.

Those same elements (and more) are also missing from the Maatta reference, the content of which is discussed in detail above. Although the Maatta reference discloses the use of buttons and clicking functionality, there is no mention of a sensor to activate or de-activate tracking when the user is touching (or not touching) a puck. Moreover, the Maatta reference makes repeated reference to re-centering of a puck by means of magnets, but mentions nowhere how to implement skating functionality with a puck. Furthermore, there is no mention, hint at or suggestion in the Maatta reference of the problems associated with having to skate far more often with a small form factor pointing device than with a conventional mouse, as discussed in greater detail above.

Accordingly, the Maatta reference does nothing to make up for the rather acute deficiencies of the Sherriff and Hagermoser references respecting the asserted obviousness of claim 40, and as a result all the arguments set forth above in Section V(B) respecting the unobviousness of the present invention also apply to claim 40.

For all the foregoing reasons and more, the presently claimed invention is not *prima facie* obvious over and in view of the Sherriff, Hagermoser and Maatta references.

(F) Claim 34 is not obvious over the Sherriff, Hagermoser and Louis references in view of Armstrong reference

Claim 34 includes all the limitations of claim 31, from which it depends. The asserted obviousness of claim 31 in respect of the combination of the Sherriff and Hagermoser references is rebutted in detail above, and the same arguments apply both such references in respect of claim 40. That is, elements (i) and (j) are missing from the Sherriff and Hagermoser references.

Those same elements (and more) are also missing from the Louis and Armstrong reference, as discussed above.

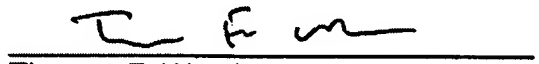
Accordingly, the added combination of the Louis and Armstrong references does nothing to make up for the rather acute deficiencies of the Sherriff and Hagermoser references respecting the asserted obviousness of claim 34, and as a result all the arguments set forth above in Section V(B) respecting the unobviousness of the present invention also apply to claim 34.

For all the foregoing reasons and more, the presently claimed invention is not *prima facie* obvious over and in view of the Sherriff, Hagermoser, Louis and Armstrong references.

VI. Summary

Claims 31-44 as presented herein are believed to be in condition for allowance. Examination of the application as amended is requested. Entry of the minor amendments to claims 42 and 43 made herein is respectfully requested. The Examiner is respectfully requested to contact the undersigned by telephone or e-mail with any questions or comments she may have.

Respectfully submitted,
Jonah Harley et al.
By their attorney



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